

Education Quality and
Accountability Office



GRADE 9 Applied
Assessment of Mathematics
SPRING 2008

Samples of Student Work

Question #6

Clarence's Quandary

Assessment of Mathematics
Grade 9 Applied Program
Open Response Scoring Guide
Spring 2008
Clarence's Quandary

PN05	Solve problems involving ratios, rates, and directly proportional relationships in various contexts (e.g., currency conversions, scale drawings, measurement), using a variety of methods (e.g., using algebraic reasoning, equivalent ratios, a constant of proportionality; using dynamic geometry software to construct and measure scale drawings) (Sample problem: Simple interest is directly proportional to the amount invested. If Luis invests \$84 for one year and earns \$1.26 in interest, how much would he earn in interest if he invested \$235 for one year?)
Code	Descriptor
B	Blank: nothing written or drawn in response to the question
I	<ul style="list-style-type: none"> - Illegible: cannot be read; completely crossed out/erased; not written in English; - Irrelevant content: does not attempt assigned question (e.g., comment on the task, drawings, "?", "!", "I don't know"); - Off topic: no relationship of written work to the question.
10	<p>Application of knowledge and skills shows limited effectiveness due to</p> <ul style="list-style-type: none"> • misunderstanding of concepts of proportional reasoning • incorrect selection or misuse of procedures to determine the dosage
20	<p>Application of knowledge and skills shows some effectiveness due to</p> <ul style="list-style-type: none"> • partial understanding of the concepts of proportional reasoning • errors and/or omissions in the application of the procedures to determine the dosage
30	<p>Application of knowledge and skills shows considerable effectiveness due to</p> <ul style="list-style-type: none"> • an understanding of most of the concepts of proportional reasoning • minor errors and/or omissions in the application of the procedures to determine the dosage
40	<p>Application of knowledge and skills shows a high degree of effectiveness due to</p> <ul style="list-style-type: none"> • a thorough understanding of the concepts of proportional reasoning • an accurate application of the procedures to determine the dose to be 60 ml (any minor errors and/or omissions do not detract from the demonstration of a thorough understanding)

Clarence's Quandary

Clarence works at a veterinarian's office. He needs to give a dose of medicine to a 24 kg dog. The recommended dosage for a dog that weighs 10 kg is 25 mL. Determine the dose Clarence should give to the 24 kg dog if the rate remains the same. Show your work.

24 kg dog
weighs 10 kg is 25 mL

10 kg 25 mL

20 kg = 50 mL

24 kg = 54 mL

∴ the dosage for a 24 kg dog
would be 54 mL.

Clarence's Quandary

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$$\begin{array}{l} (x1) \frac{\text{kg}}{10} = \frac{\text{mL}}{25} \\ (x2) 20 = 50 \\ (x12) 24 = 60 \end{array}$$

a dog that ways 24kg will need a dosage
of 60mL

Clarence's Quandary

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$$\begin{array}{r} 10\text{kg} \\ 10\text{kg} \\ \hline 20\text{kg} \end{array} \quad \begin{array}{r} 25\text{mL} \\ 25\text{mL} \\ \hline 50\text{mL} \end{array} \quad \begin{array}{l} 24\text{kg} \\ \text{because} \end{array}$$

Clarence should give the dog of 24kg 55mL.

Clarence's Quandary

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$$10 + 15 = 25$$

$$24 + 15 = 39$$

The 24 kg dog should get 39 mL of medicine for him.

Clarence's Quandary

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$$10 \times 2 + 4 = 24$$

$$25 \times 2 = 50$$

$$25 \div 2 = 12.5$$

$$\begin{array}{r} 50 \\ + 12.5 \\ \hline 62.5 \end{array}$$

I think Clarence should give the dog 62.5 mL of medicine.

... Clarence's Quandary

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24 Kg Dog

$$10 = 25 \text{ mL}$$

$$20 = 50 \text{ mL}$$

$$24 = 56.25$$

$$25 \div 4 = 6.25$$

\therefore The 24 kg Dog
Should be given
56.25 mL of medicine.

. Clarence's Quandary

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$$25 \times 2 = 50$$

$$2.5 \times 4 = 10$$

$$= 60 \text{ ml}$$

. Clarence's Quandary

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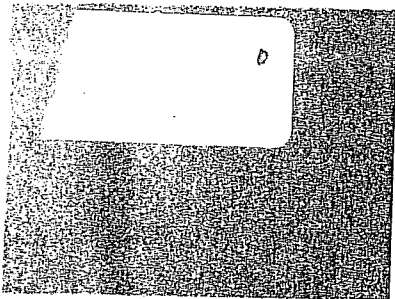
- 24 kg dog
- the regular dosage for a dog that weighs 10 kg is 25 mL

$$10 + 14 = 24$$

$$24 \div 10 = 34$$

$$34 \times 10 = 44 \text{ mL}$$

So you should give the dog 44 mL.



.. Clarence's Quandary

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1

10 x 2.5 so it's 25 mL

$$10 \div 2.5 = .4 \times 4 = 1.6 \text{ mL}$$

$$= 51.6 \text{ mL}$$

therefor you would give the dog 51.6

Clarence's Quandary

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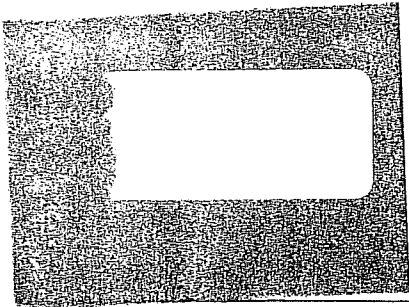
$$10 + 10 = 20 \text{ kg}$$

$$20 \text{ kg} = 50 \text{ mL}$$

$$2.5 \times 4 = 10 \text{ kg}$$

$$20 \text{ kg} + 10 \text{ kg} = 30 \text{ kg}$$

\therefore the dog need 30 kg
of medicine.



. Clarence's Quandary

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Dog	med.
10k	25ml
20k	50ml
30 ←	75ml

$$50\text{ml} - 75\text{ml}$$

The amount of number between
that would be 22

half of 22 is 11. between

50 and 75 is 61. but would use sixty because the dog is
24kg.

∴ the dose of medicine

to a 24kg dog is

60ml

Clarence's Quandary

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$$10 \times 25 = 250$$
$$250 \div 24 = 10.4$$

. Clarence's Quandary

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$$\begin{aligned} 25 \div 10 \\ = 2.5 \\ 2.5 \text{ mL per 1 kg} \end{aligned}$$

$$\begin{aligned} 2.5 \times 24 \\ = 60 \text{ mL} \end{aligned}$$

a 24 kg dog will need 60 mL of medication

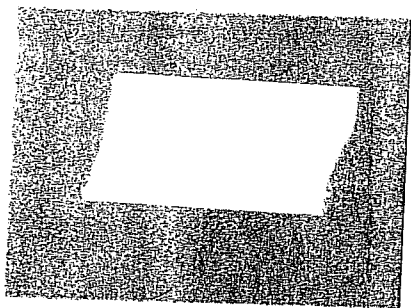
. Clarence's Quandary

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$$10 \text{ kg is } 25 \text{ mL}$$

$$24 + 10 = 34$$

∴ Clarence needs to give the dog
34 mL.



Clarence's Quandary

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$$25\text{mL} \times 2 = 50\text{mL}$$

$$10^{\text{kg}}/25\text{mL} \div 2 = 5^{\text{kg}}/12.5\text{mL}$$

$$1^{\text{kg}}/0.4\text{mL}$$

$$12.5\text{mL} - 0.4 = 12.1\text{mL}$$

$$50\text{mL} + 12.1\text{mL} = 62.1$$

She should give a dose of 62.1 mL

Clarence's Quandary

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$$10 \text{ kg} = 25 \text{ mL}$$

$$1 \text{ kg} = \frac{25 \text{ mL}}{10 \text{ kg}}$$

$$1 \text{ kg} = 2.5 \text{ mL}$$

$$2.5 \text{ mL} \times 24 \text{ kg}$$

$$= 60 \text{ mL}$$

The dog would need 60 mL of medicine.

Clarence's Quandary

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$$24 \div 10 = 2.4$$

$$25 \times 2 = 50$$

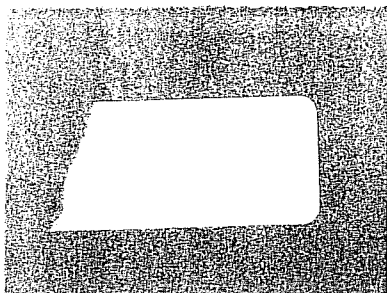
$$25 \div 4 = 6.25$$

$$50:$$

$$+ 6.25$$

$$\hline 56.25$$

Clarence should give to the 24 kg dog if the rate remains the same 56.25 mL.

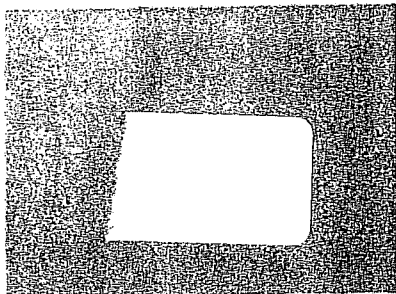


Clarence's Quandary

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$$\begin{array}{r} 10 + 15 = 25 \text{ mL} \quad 10 + 14 = 24 \text{ kg} \\ \swarrow \quad \searrow \\ 14 + 15 = 29 \text{ mL} \end{array}$$

She needs to give the dog 29 mL of meds.



Clarence's Quandary

Clarence works at a veterinarian's office. He needs to give a dose of medicine to a 24 kg dog. The recommended dosage for a dog that weighs 10 kg is 25 mL. Determine the dose Clarence should give to the 24 kg dog if the rate remains the same. Show your work.

$$10 \text{ kg} = 25$$

$$20 \text{ kg} = 25 + 25 = 50$$

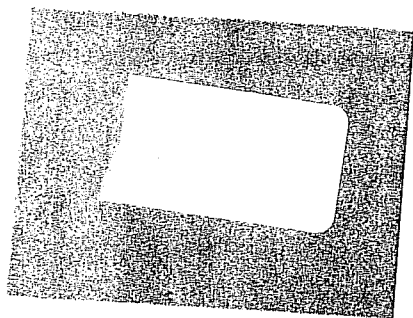
$$4 \text{ kg} = 6.25$$

$$\frac{25}{4 \text{ kg}} = 6.25$$

$$50 + 6.25$$

$$= 56.25 \text{ mL}$$

for a 24 kg dog.



.. Clarence's Quandary

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Let n represent the recommended dosage

$$\frac{24 \text{ kg}}{n} \times \frac{10}{25 \text{ mL}}$$

$$\frac{600}{10} \quad \frac{10n}{10}$$

$$60 = n$$

∴ The dose should Clarence give to his dog is 60 mL

Clarence's Quandary

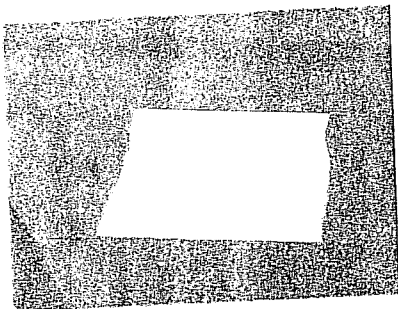
Clarence works at a veterinarian's office. He needs to give a dose of medicine to a 24 kg dog. The recommended dosage for a dog that weighs 10 kg is 25 mL. Determine the dose Clarence should give to the 24 kg dog if the rate remains the same. Show your work.

$$10 \text{ kg} = 25 \text{ mL}$$

$$20 \text{ kg} = 50 \text{ mL}$$

$$25 \text{ kg} = 62.5$$

about 60 mL



11. Clarence's Quandary

Clarence works at a veterinarian's office. He needs to give a dose of medicine to a 24 kg dog. The recommended dosage for a dog that weighs 10 kg is 25 mL. Determine the dose Clarence should give to the 24 kg dog if the rate remains the same. Show your work.

$$24 \text{ kg} - 10 \text{ kg}$$

$$= 14 \text{ kg}$$

$$25 + 25$$

$$= 50$$

Clarence's Quandary

Clarence works at a veterinarian's office. He needs to give a dose of medicine to a 24 kg dog. The recommended dosage for a dog that weighs 10 kg is 25 mL. Determine the dose Clarence should give to the 24 kg dog if the rate remains the same. Show your work.

$$10 : 25 = 24 : x$$

$$\frac{10}{25} = \frac{24}{x}$$

$$\frac{10x}{10} = \frac{600}{10}$$

$$x = 60 \text{ mL}$$

.. Clarence's Quandary

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$$10:25 = 24:x$$

$$\frac{10}{25} = \frac{24}{x}$$

$$\frac{10x}{10} = \frac{600}{10}$$

$$x = 60 \text{ mL}$$

∴ Clarence should give the 24 kg dog a dose of 60 mL

Clarence's Quandary

Clarence works at a veterinarian's office. He needs to give a dose of medicine to a 24 kg dog. The recommended dosage for a dog that weighs 10 kg is 25 mL. Determine the dose Clarence should give to the 24 kg dog if the rate remains the same. Show your work.

$$24 \text{ kg} \quad 10 \text{ kg} \rightarrow 25 \text{ mL}$$

$$24 - 10 = 14 \quad 23 + 25 = 58$$

$\therefore 58 \text{ mL}$ to the dog that's sick.

.. Clarence's Quandary

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~~10 x 25 = 250~~

$$10 \div 25 = 0.4 \text{ mL per kg.}$$

$$0.4 \times 24 = 9.6 \text{ mL}$$

Add to regular for answer

$$25 + 9.6 = 34.6 \text{ mL}$$

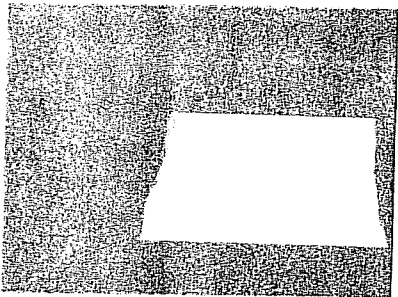
So Clarence ~~works~~ gives the dog a 34.6 mL Dosage.

. Clarence's Quandary

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$$\begin{aligned} 10 \text{ kg} \times 25 \\ = 250 \div 24 \\ = 10.4 \text{ kg} \end{aligned}$$

The amount of dose the dog is supposed to get is 10.4 kg. I know this because what I did was that I multiplied 10 by 25 and got 250 so then I divided 250 from 24 and I got the answer 10.4 kg.



1. Clarence's Quandary

Clarence works at a veterinarian's office. He needs to give a dose of medicine to a 24 kg dog. The recommended dosage for a dog that weighs 10 kg is 25 mL. Determine the dose Clarence should give to the 24 kg dog if the rate remains the same. Show your work.

$$= 24 \text{ kg} \times 25$$

$$= 24 \times 25$$

$$= 600$$

Clarence's Quandary

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$$\begin{array}{r} 25 \\ \div 10 \\ \hline 2.5 \end{array}$$

2.5 mL per kg

$$24 \times 2.5 = 60 \text{ mL}$$

Clarence should give
the dog 60 mL

. Clarence's Quandary

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for ever 10 kg he gives the dog 25 mL

$$10 - 24 = 14$$

